

INFRAPIPE MANNINGS GRAPHS FOR DN100-3200 WITH GRADIENTS 1:5 TO 1:1000

These tables are for engineers, contractors, consultants and asset managers who are reasonably familiar with gravity hydraulic design. They show the flow rate and flow velocity for a pipe for a given gradient.

This document is supported by the <u>Design Manuals</u> and other <u>Datasheets</u> available from INFRAPIPE:, please see the <u>Infrapipe website</u> for more details.

Visit the <u>Downloads section</u> for a complete list of all available documents.

The tables show 3 different Mannings numbers:

- 0.009 the recommended figure for HDPE pipes in NZS4404:2010 Land development and subdivision infrastructure
- 0.011 which makes a moderate allowance for sediment, debris or the entrainment of air
- 0.013 which is suitable for an application with heavy sedimentation and debris

Both the NZ Building Code and NZTA (P-46) stipulate 0.011 for HDPE and 0.013 for concrete. This translates to a difference of hydraulic capacity of 15-20%.

For each Mannings number the tables are split by gradient:

One for extreme gradients from 1:5 to 1:100 (0.02 to 0.1), the other for 1:100 to 1:1000 (0.01 to 0.001)

For each gradient group there are then two tables:

✓ Firstly DN100:DN1000, then DN1000-DN3200

(with INFRAPIPE, the DN is exactly the OD above 300)

Starting with a flow rate and gradient, trace up the gradient line to intercept the flow rate and select the **pipe size** (solid line) above it.

To obtain the **flow velocity**, then follow the gradient up to the dashed line for that pipe size and read the flow velocity.

These tables are guides only and final calculation should still be performed for design.

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PIPES

WHICH PIPE FOR FLEXIBLE PIPE

INFRAPIPE operates two types of equipment – the helical <u>KRAH</u> plant for complex and larger pipes, and the twinwall plant for smaller and simpler applications. The twinwall makes product in 3 stiffness ratings – SN6, 8 & 16. The <u>KRAH</u> by contrast can make any SN rating from 1.5 to 40+. Please use this table below to confirm which sizes are available for which applications.

Note the <u>KRAH</u> machine also makes solid wall in DN450-2000 see later pages for sizing tables to achieve the required PN/SDR.



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DN100-DN1000



Mannings number 0.009

Page 4





Mannings number 0.009

DN1000-DN3200 Gradient 1:5 to 1:100 (0.2-0.01)



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follow **SINFRAPIPE**

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DN1000-DN3200



Gradient 1 in

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Mannings number 0.011

DN1000-DN3200 Gradient 1:5 to 1:100 (0.2-0.01)









DN100-DN1000

Gradient 1 in

Page 10





Flow Velocity (V) [m/s]

Mannings number 0.011

Page 11

DN1000-DN3200 Gradient 1:100 to 1:1000 (0.01-0.001)















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Gradient 1:100 to 1:1000 (0.01-0.001) 3.20 - Flow Rate (Q) --- Flow Velocity (V) 3.40 3.20 3.10 2.90 2.80 2.70 2.60 2.50 Nominal Pipe Diameter (Flow Rate) 2.80 O DN100 DN375 -> DN700 2.40 DN150 DN450 DN800 🗢 DN225 DN525 DN900 -1,60 Δ DN300 -00- DN600 ->- DN1000 1.20 2.40 2.30 1 2.20 2.10 0.80 1.90 0.56 0.52 0.48 0.44 0.40 0.36 1.80 1.70 1.60 1,50 0.32 0.28 1.40 0.24 1.30 1.20 0.16 [m/s] 1.10 Flow Rate (Q) [m³/s] 0.12 1 0.1 Ξ 0.90 0.080 Flow Velocity 0.80 0.056 0.052 0.048 0.044 **0.040** 0.036 0.70 0.032 0.60 0.028 0.024 0.016 0,012 0.01 0.40 0.0080 0.34 0.32 0.31 0.30 0.29 0.28 0.27 0.26 0.0056 0.0052 0.0048 0.0044 0.0040 0.0036 0.0032 0.0028 0.25 0.0024 Nominal Pipe Diameter (Flow Velocity) 0.23 DN100 DN375 -+- DN700 and the second 0.22 DN150 DN450 ----- DN800 -08-0.21 0,0016 DN225 <u>_</u>___ DN525 --- DN900 🛨 · DN300 -00--DN600 → DN1000 0.19 0.0012 0.18 1000 900 800 700 600 500 400 300 200 100 95 Gradient 1 in

DN100-DN1000

Mannings number 0.013

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Flow Velocity (V) [m/s]

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